PATENT SPECIFICATION

(11) 1 372 424

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(21) Application No. 53270/71 (22) Filed 17 Nov. 1971
(31) Convention Application No. 7 042 866
(32) Filed 27 Nov. 1970 in
(33) France (FR)
(44) Complete Specification published 30 Oct. 1974
(51) International Classification B32B 7/02, 5/18, 5/24
(52) Index at acceptance B5N 0518 0524 0702

(54) IMPROVEMENTS IN OR RELATING TO FLOOR COVERINGS

We, SOCIETE ANONYME OMINUM DE PROSPECTIVE INDUSTRIELLE, a French Body Corporate of 2, rue Jean de Caulaincourt, 02-SAINT-QUENTIN (Aisne) France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to floor coverings.

According to the pesent invention, there is provided a composite floor covering comprising an underlayer and a layer of fabric adhered to the upper surface of the underlayer, the upper surface of the fabric layer constituting the upper tread surface of the floor covering and the underlayer being such that its density at its upper surface is greater that that at its lower surface and that its density does not increase with increasing distance from the upper surface of the underlayer.

Embodiments of the invention will now be described, by way of example only.

One preferred embodiment of a floor covering comprises an underlayer made of a supple cellular material having a varying porosity throughout its thickness whereby the density of the layer varies throughout its thickness. More particularly, the density decreases as a function of distance away from the upper surface of the layer. The upper surface of the layer which has the highest density is secured to a fabric layer, whilst the lower surface of the layer, which surface has the lowest density, will be in contact with the floor. According to the thickness of the underlayer and the type of cellular material used, this density can vary for example from between 1200 kg/m³ for the upper surface of the underlayer, and 200 kg/m³ for the lower surface of the underlayer.

It is possible to manufacture such an underlayer, but the degree of expansion must be closely controlled during manufacture. It is therefore preferred to form the underlayer from a plurality of different layers each of different density which are connected together to form an assembly whose density varies stepwise throughout its thickness. Preferably, the average density of the underlayer is about 500 to 600 kg/m³.

According to another embodiment, the underlayer can be constituted by an expanded synthetic foam, for example of polyurethane, the density of which after expansion is 500 kg/m³. However, in order to obtain the desired properties, the upper surface of the foam is strengthened by incorporating, at the moment of expansion, a web which serves to increase the density at this surface.

The underlayer can alternatively be formed by using expanded PVC with a density of 200 to 300 kg/m³. The desired density characteristics are obtained by adhering a sheet of high density PVC to the upper surface at the moment of expansion; in this case, a complex can be obtained which has three different density zones, namely: an upper zone onto which the fabric is adhered, the density of which zone is between 1000 and 1200 kg/m³ according to the material used, a second zone of very small thickness and having a density of about 500 kg/m³, resulting from the adhesive used for the high density layer, and finally a zone of density of 200 to 300kg/m³.

A woven fabric for example a velvet-type woven fabric having a weight of between 70 and 120 g/m² is applied to the upper surface of the underlayer. Thus there is obtained a floor covering which has the mechanical characteristics of suppleness, and resitstance to wear and tear and to stamping which are conferred by the underlayer with the varying density. The fabric layer which

constitutes the outer surface of the floor covering can be made with synthetic fibres which provide good resistance to abrasion and, moreover, if this fabric is a brushed knitted fabric, it will be advantageous to break the loops thus formed, in order to further improve the resistance to abrasion and to increase the length of the pile, whereby the floor covering has the appearance of a conventional pile carpet.

In this latter case, it is useful to fix the stitch after the brushing and loop breaking operations. This operation may be effected either at the time at which the fabric is adhered to the underlayer, or directly on the reverse side of the knitted fabric with the aid of a finish. Furthermore, the adherence of the fabric to the underlayer can be further increased by using a brushed knitted fabric, the loops of which are broken on the upper surface and only slightly brushed on the lower surface.

The fabric may be dyed or printed according to conventional techniques used in the textile industry. It is however advantageous to effect this finishing operation only when the fabric has been adhered to one of the elements of the cellular underlayer. In fact, it is possible in this case to use the thermal energy necessary for terminating the cellular expansion in order to ensure the fixing of the dyes or pigments used.

In the floor covering particularly described, the defects that would occur if a light-weight fabric were glued to an underlayer having a constant density throughout its thickness, are avoided, such defects being insufficient resistance to wear and tear and lack of suppleness of the covering.

The covering particularly described has an underlayer which acts to absorb shock and imparts to the covering, properties of suppleness, and resistance to wear and tear, and to abrasion and stamping. Further, the underlayer enables a light-weight woven fabric to be used to form the upper layer of the covering.

WHAT WE CLAIM IS:—

1. A composite floor covering comprising an underlayer and a layer of fabric adhered to the upper surface of the underlayer, the upper surface of the fabric layer constituting the upper tread surface of the floor covering and the underlayer being such that its density at its upper surface is greater than that at its lower surface and that its density does not increase with increasing distance from the upper surface of the underlayer.

2. A floor covering as claimed in claim 1, wherein the fabric is a velvet-type fabric having a weight of between 70 and 120 g/m^2.

3. A floor covering as claimed in claim 1 or claim 2, wherein the underlayer is made of a cellular material having a density which progressively decreases as a function of the distance from the upper surface of the underlayer.

4. A floor covering as claimed in claim 1 or claim 2, wherein the underlayer is constituted by at least two layers of different densities.

5. A floor covering as claimed in claim 1 or claim 2, wherein the underlayer is constituted by an expanded foam, the upper surface of this foam incorporating a web placed at the moment of expansion.

6. A floor covering as claimed in claim 1 or claim 2, wherein the underlayer is constituted by an expanded foam, the upper surface of this foam incorporating a layer of high density plastics material adhered thereto at the moment of expansion.

7. A floor covering as claimed in claim 1, wherein the fabric is a knitted fabric made of brushed and loop broken synthetic fibres.

8. A floor covering as claimed in claim 7, wherein the knitted fabric is coated by a finish before being adhered to the underlayer.

9. A composite floor covering as claimed in claim 1, as hereinbefore described.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1974.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

1 372 425